

J. Waldburg

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The Southern Agriculturist.

(NEW SERIES.)

Vol. V.

FOR NOVEMBER, 1845.

No. 11.

From Boussingault's Rural Economy.

METEOROLOGICAL CONSIDERATIONS.

[Continued from page 372.]

§ 4. *Cooling through the night ; Dew, Rain.*

When the sky is clear and calm during the night, vegetables cool down and very soon show a temperature inferior to that of the air which surrounds them. This property of cooling in such circumstances belongs to all bodies ; but all do not possess it to the same degree. Organic substances, for instance, such as wool or cotton, feathers, &c., radiate powerfully and sink low ; polished metals, on the contrary, have a very weak emissive or radiating power ; and air and the gases in general radiate still more feebly.

Inasmuch as a body is continually emitting heat, its temperature can only remain stationary so long as it receives from surrounding objects at every instant a quantity of caloric precisely equal in quantity to that which it loses, from its surface.

From the moment that these incessant exchanges cease to be in a state of perfect equality, the temperature of a body varies ; it may even experience a considerable degree of cooling if it is exposed during a clear night in an open spot. In such circumstances, a body gives off towards all the visible parts of the heavens more heat than it receives ; for the higher regions of the atmosphere are excessively cold, a fact which is proved by the rapid diminution of temperature experienced on ascending mountains, or by rising into the air in balloons. The internal temperature of the globe, the tendency of which would be to compensate the loss experienced by the body which radiates, has scarcely any effect in lessening the cooling, because it is propagated with extreme slowness, in consequence of the indifferent conducting powers of the earthly substances of which its crust is composed. The air, lastly, which surrounds the radiating body, does not warm it save in the most minute, inappreciable degree, and rather by its contact than by transmitting to it rays of heat, for the gases have only very limited emissive powers. It is even in consequence of the small amount of this power that the stratum of air in contact with the surface of the ground, does not by any means sink in the same proportion as the surface upon which it lies. Thus, in the circumstances which I have indicated, a thermometer laid upon the ground always indicates a temperature lower than that

which is proclaimed by one suspended in the air; and the difference is by so much the greater as the radiating power of the bodies exposed is more decided, or as it may take place into a greater extent of the heavens. Every cause which agitates the air, which disturbs its transparency, which contracts the extent of the visible sphere, interferes with nocturnal radiation, and therefore with cooling. A cloud, like a screen, compensates either in whole or in part according to its proper temperature, for the loss of heat which a body upon the surface of the earth experiences in radiating into space. Wind, by continually renewing the air which is in contact with the surface of bodies tending to cool by radiation, always diminishes its effect to a certain extent. It is for this reason that a cloudless sky and a calm atmosphere, when nocturnal radiation attains its maximum, are most dangerous or injurious to our harvests.

In a night which combines all the conditions favorable to radiation, a thermometer of small size laid upon the grass will be found to mark from 10° to 14° or 15° Fahrenheit below the temperature of the surrounding atmosphere. Thus in the temperate zone in Europe, as Mr. Daniell has observed, the temperature of meadows and heaths is liable to fall during ten months of the year by the mere effect of nocturnal radiation to a temperature below the freezing point of water; this is particularly apt to happen both in spring and autumn, when the destructive effects of radiation are most to be apprehended, the nocturnal radiations of those seasons frequently lowering the temperature several degrees below the freezing point.

A few observations which I made upon nocturnal radiation at different heights in the Cordilleras, seem to indicate that its effects there are less decided than in Europe, in consequence perhaps of the greater quantity of heat acquired by the ground in the course of the day. It appears that in this mountain range it rarely freezes at a height less than 6560 feet above the level of the sea; although there are certain circumstances there which favor nocturnal radiation so much, that it is really impossible to indicate any very precise limits. In a general way it may be said that the crops of those plains which are sufficiently elevated to have a mean temperature of from 50° to 58° Fahr. are exposed to suffer from frost; it frequently happens that a crop of wheat, barley, maize, or potatoes, of the richest appearance, is destroyed in a single night by the effect of radiation. In Europe during the fine nights of April and May, when the air is calm and the sky clear, buds, leaves, and young shoots are frequently cut off, are frozen; in a word, although a thermometer in the air indicates several degrees above the point of congelation. Market gardeners and others who are much exposed to loss from this cause ascribe the effect to the light of the moon of the months of April and May; and they ground their opinion upon the fact that when the sky is clouded, the destructive effects of frost are not apparent, although the same temperature of the atmosphere be indicated by a thermometer.

In the lower ranges of the Cordilleras, farmers also ascribe the same injurious consequences to the light of the moon, with this difference, that according to them the destructive influence continues throughout the year; and it is not unworthy of remark that, in the neighborhoods of Paris and of London, the mean temperature of the months of April and May (from 50° to 57° , or 58° F.) represents exactly the invariable climate of those places among the Andes, where the effects of frost upon vegetation are particularly to be apprehended. M. Arago has shown, that the cold ascribed to the light of the moon is nothing but a consequence of the nocturnal radiation, at a season when the thermometer in the air is frequently at from 40° to 43° F. and the sky is clear and calm. At this temperature a plant, radiating into space, readily falls below the point of congelation, and then the hopes of the gardener and farmer are destroyed. The phenomenon takes place particularly in a bright night; and if the moon happen to be up when it occurs, the influence is ascribed by the vulgar to her light. Were the sky clouded, the principal condition to radiation would be wanting; the temperature of objects on the surface of the ground would not fall below that of the surrounding medium, and plants would not freeze unless the air itself fell to 32° F.

The observation of gardeners, therefore, as M. Arago remarks, was not in itself false, it was only incomplete. If the freezing of the soft and delicate parts of vegetables in circumstances when the air is several degrees above the freezing point, be really due to the escape of caloric into planetary space, it must happen that a screen placed above a radiating body, so as to mask a portion of the heavens, will either prevent or at least diminish the amount of the cooling. And that this takes place in fact, appears from the beautiful experiments of Dr. Wells. A thermometer, placed upon a plank of a certain thickness, and raised about a yard above the ground, occasionally indicates in clear and calm weather from 6° to 7° or 8° F. less than a second thermometer attached to the lower surface of the plank. It is in this way that we explain the use of mats, of layers of straw, in a word, of all those slight coverings which gardeners are so careful to supply during the night to delicate plants at certain seasons of the year. Before men were aware that bodies on the surface of the ground became colder than the air which surrounds them during a clear night, the rationale of this practice was not apparent; for it was altogether impossible to conceive that coverings so slight could protect vegetables from a low temperature of the air.

The means indicated, as simple as they are effectual in protecting plants in the garden, are rarely applicable in farming, where the surface to be preserved is always very extensive. Nevertheless, in severe winters, the frost by penetrating the ground would frequently destroy the fields sown in autumn, were it not that in high latitudes the snow which covers the surface becomes a powerful obstacle to excessive cooling, by acting at one and the same time as a covering,

and as a screen preventing radiation. As a covering, because snow is one of the worst of conductors, one of those substances which for a given thickness opposes the passage of heat most effectually; it is, therefore, an obstacle almost insurmountable to the earth beneath it getting into equilibrium in point of temperature with the atmosphere. As a screen, because in sheltering the ground it prevents it from undergoing the cooling which it would not fail to experience in clear nights by radiation into the open firmament. It is familiarly known in many parts of Europe, that the accidental want of the usual covering of snow will cause the loss of the autumn-sown crops of grain. It is on the surface of the snow that the great depression of temperature takes place; and the substance being a very bad conductor, the earth cools in a much less degree. In the month of February, 1841, I made some experiments, which show that the snow which covers the ground acts in the manner of a screen. I had first a thermometer upon the snow, the bulb of the instrument being covered by from 0.078 to 0.117 of an inch of snow in powder; second, a thermometer, the bulb of which was situated completely under the layer of snow in contact with the ground; third, a thermometer in the open air, at about 37 or 38 feet above the surface, on the north of a building. The layer of snow was about four inches in thickness, and had covered a field sown with wheat for a month. The sun shone brightly upon the field on those days when my experiments were made.

Feb. 11. Five o'clock in the evening; the sun has been hidden by the mountains for half an hour; the sky is unclouded, the air very calm: thermometer under the snow, 32° F.; thermometer upon the snow, 29° F.; thermometer in the air, 36.3° F.

Feb. 12. The night very fine, no clouds, the air calm. At seven o'clock in the morning, the sun is not yet upon the field: thermometer under the snow, 26.2° F.; thermometer upon the snow, 10° F.; thermometer in the air, 26.3° F.

At half-past five in the evening, the sun behind the mountains: thermometer under the snow, 32° F.; thermometer upon the snow, 29° F.; thermometer in the air, 37.5° F.

Feb. 13. At seven in the morning; the sky gray, the air slightly in motion: thermometer under the snow, 28° F.; thermometer upon the snow, 17° F.; thermometer in the air, 25° F.

At half-past five in the evening; the air calm, the sky cloudless, the sun already concealed for some time; thermometer under the snow, 32° F.; thermometer upon the snow, 30° F.; thermometer in the air, 40° F.

Feb. 14. Seven in the morning, wind W., a fine rain falling: thermometer under the snow, 32° F.; thermometer upon the snow, 32° F.; thermometer in the air, 35.7° F.

When we reflect upon the losses occasioned to farmers and market gardeners by frost that are entirely due to nocturnal radiation at seasons of the year when vegetation has already made considerable progress, we ask eagerly if there be no possible means of guard-

ing against them. I shall here make known a method imagined and successfully followed by South American agriculturists with this view. The natives of the upper country in Peru who inhabit the elevated plains of Cusco, are perhaps more than any other people accustomed to see their harvest destroyed by the effects of nocturnal radiation. The Incas appear to have ascertained the conditions under which frost during the night was most to be apprehended. They had observed that it only froze when the night was clear and the air calm: knowing consequently that the presence of clouds prevented frost, they contrived to make as it were artificial clouds to preserve their fields against the cold. When the evening led them to apprehend a frost—that is to say, when the stars shone with brilliancy, and the air was still—the Indians set fire to a heap of wet straw or dung, and by this means raised a cloud of smoke, and so destroyed the transparency of the atmosphere from which they had so much to apprehend. It is easy in fact to conceive that the transparency of the air can readily be destroyed by raising a smoke in calm weather; it would be otherwise were there any wind stirring; but then the precaution itself becomes unnecessary, for with air in motion, with a breeze blowing, there is no reason to apprehend frost from nocturnal radiation.

The practice followed by the Indians just described is mentioned by the Inca Garcillaso de la Vega in his *Royal Commentaries of Peru*. Garcillaso in the imperial city of Cusca, and in his youth, had frequently seen the Indians raise a smoke to preserve the fields of maize from the frost.*

The cooling of bodies occasioned by nocturnal radiation is always accompanied by a deposit of moisture upon their surface under the form of minute globules: this is dew. The ingenious experiments of Wells having demonstrated that the appearance of dew always follows, never precedes the fall in temperature of the bodies on which it is deposited, the phenomenon cannot be attributed to any thing more than a simple condensation of the watery vapor contained in the air, comparable in all respects to that which takes place upon the surface of a vessel containing a fluid that is colder than the air.† The quantity of moisture dissolved in the atmosphere is by so much the greater as the temperature is higher. In very warm climates the dew is so copious as to assist vegetation essentially, supplying the place of rain during a great part of the year.

According to some meteorologists dew is most copious near the sea-board of a country; very little falls in the interior of great continents, and indeed is said only to be apparent in the vicinity of lakes and rivers.‡ I cannot agree in any statement of this kind made so absolutely. I have never had occasion to see more copious dews than those which occasionally fall in the steepes of San Martin to

* The good effects of smoke in preventing nocturnal congelation are also signalized by Pliny the naturalist.

† Arago, *Annuaire des Longitudes*, Année 1837, p. 160.

‡ Kaemtzt, *Meteorology*, translated by W. Walker, London, 1844.

to the east of the eastern Cordilleras, and at a very great distance from the sea; the dew was so copious that for several nights I found it impossible to employ an artificial horizon of black glass in order to take the meridian altitude of the stars; the moment the apparatus was exposed there was such a quantity of water deposited on the surface that it soon gathered into drops and trickled off. I found it necessary to have recourse to mercury to reflect the star under observation. During the clear calm nights the turf of these immense plains receives a considerable quantity of moisture in the form of dew, which materially assists vegetation, and by its evaporation tempers the excessive heat of the ensuing day. In tropical countries the forests contribute to keep down the temperature. In very hot countries it is rare to be out in a cleared spot, when the night is favorable to radiation, without hearing drops of water, produced by the copiousness of the dew, falling continually from the surrounding trees, so that forests contribute further to produce and to maintain springs by acting as condensers of the watery vapor dissolved in the air. I might cite a number of observations upon this point which I made in the forest of Cauca. In the bivouac between the 4th and 5th of July, 1827, the night was magnificent; nevertheless, in the forest which began at the distance of a few yards from our encampment, it *rained abundantly*; by the light of the unclouded moon we could see the water running from the branches.

It is possible that the transpiration from the green parts of the trees might have been added to the dew condensed, and so increased the intensity of the phenomenon which I have described; but I rather incline to believe that the cooling of the leaves by way of radiation had by far the largest share in the production of this dew-rain. It is true that of all the leaves which form the crown of a tree, those whose surface is exposed and radiate freely into space intercept, as would a screen, the radiation of the leaves and branches which are not so exposed, but, as M. de Humboldt has observed, if the leaves and branches which crown a tree cool directly by emission, those which are situated immediately beneath them by radiating towards the lower parts of the leaves which are already cooled a greater quantity of heat than they receive, their temperature will also necessarily fall, and the cooling will thus be propagated from above downward until the whole mass of the tree feels its effects. It is thus that the ambient air circulating through the leaves becomes cooled during bright nights, and to judge from the influence which forests exert in lowering the temperature of a country, it is enough to recollect with M. de Humboldt that by reason of the vast multiplicity of leaves, a tree, the crown of which does not present a horizontal section of more than about 120 or 130 square feet, actually influences the cooling of the atmosphere by an extent of surface several thousand times more extensive than this section.

The proportion of watery vapor which a gas will retain in solution is by so much the greater as the temperature of the air is higher. All the causes which cool air saturated with watery vapor

occasioned, as we have already seen, the precipitation of a certain quantity of moisture.

When this condensation takes place in the midst of a gaseous mass, the precipitated water collects into small floating vesicles, which trouble the transparency of the medium that momentarily holds them in suspension. Mists, fogs, and clouds are collections of these vesicles; a fog, as a celebrated naturalist said, is a cloud in which one is, and a cloud is a fog in which one is not.

The vesicles of clouds tend towards the earth, like all heavy bodies, but by reason of their specific lightness the resistance of the air which they displace lessens the rapidity of their descent. When they are of larger size they coalesce and form drops of water which fall with greater celerity. When these drops pass through strata of very dry air they undergo partial evaporation, and this is the reason wherefore there is sometimes less rain upon plains than upon mountains. In opposite circumstances it is the inverse phenomenon that is observed; the drops increase in size in passing through the inferior strata of an atmosphere saturated with moisture, condensing vapor in their course. This is what happens most generally.

In taking a survey of a large amount of observations, meteorologists have inferred that the annual quantity of rain varies with the latitude; that, greatest at the equator, it gradually lessens as higher northern and southern latitudes are attained; this is as much as saying that the quantity of rain is greater as the temperature of the climate is higher. But to this rule there are numerous exceptions; for instance, under the line at Payta on the sea-coast it only rains very rarely; a shower of rain is an event, and when I visited the country eighteen years had elapsed since they had had any thing of a fall of rain. Local causes have the greatest influence upon the fall of rain, so that countries on the same parallel of latitude are far from being equally distinguished by dryness or humidity.

It is believed that in Europe it rains more heavily and more frequently in the day than in the night. In the equinoctial regions, at least in those parts that I have visited, it would seem that the opposite rule held good. Every one in South America allows that it rains principally during the night, and the observations which I made in the neighborhood of Marmato enable me to state that of 7.874 inches of rain which fell in the month of October, 1.336 inches fell in the day, 5.638 inches in the night; of 8.881 inches which fell in the month of November, 0.707 inches came down in the day, 8.174 inches in the night; of 5.934 inches which fell in December, 0.786 inches fell in the day, 5.148 inches in the night.

Two series of observations taken in the same country at two stations not far from one another, but situated at very different elevations, seem to confirm, in reference to the equatorial regions, the conclusions of European meteorologists as to the fact that the annual quantity of rain which falls diminishes as the height above the level of the sea increases. They also show that in latitudes

which do not differ materially, more rain falls where the mean temperature is 68° F. than where it is 58° F.

Marmato lies in N. lat. $5^{\circ} 27''$, and $75^{\circ} 11''$ (?) W. long. at a height of 4676 feet above the level of the sea; Santa Fé in N. lat. $4^{\circ} 36''$, W. long. $75^{\circ} 6''$, at a height of 8692 feet above the level of the sea. And while the quantity of rain at the former place amounted, according to my own observation for 1833, to 60 inches, according to Caldras, in 1807, at the latter there fell but 39.4 inches.

In temperate climates the quantity of rain that falls varies with the seasons. Near the equator, where the temperature remains constant throughout the year, the rainy season commences precisely at the period when the sun approaches the zenith; and whenever the latitude of a place in the torrid zone where it rains is of the same denomination and equal to the declination of the sun, storms occur. In such circumstances the sky in the morning is of remarkable purity, the air is calm, the heat of the sun insupportable. Towards noon clouds begin to show themselves upon the horizon, the hygrometer does not advance towards dryness as it usually does, it remains stationary, or even falls towards extreme humidity. It is always after the sun has passed the meridian that the thunder is heard, which being preceded by a light wind is soon followed by a deluge of rain. In my opinion the permanence or incessant renovation of storms in the bosom of the atmosphere is a capital fact, and is connected with one of the most important questions in the physics of our globe, that of the fixation of the azote of the air by organized beings.

The most recent inquiries show dry atmospherical air to consist in volume of:

Oxygen	20.8
Azote	79.2

The air contains in addition from 2 to 5 10,000ths of carbonic acid gas, and quantities perhaps still smaller of carbureted combustible gas. The experiments of M. Theodore de Saussure, as well as those of Professor Liebig, have further demonstrated in it traces of ammoniacal vapor.

I have already shown that animals do not directly assimilate the azote of the atmosphere. Azote is nevertheless an element essential to the constitution of every living being, and is met with indifferently in either kingdom of nature. If we inquire into the source of this principle in connection with the herbivorous tribes of animals, we find it as an element in the food which sustains them. If we next inquire into the immediate origin of the azote which enters into the constitution of vegetables, it is discovered in the manure which proceeds more especially from animal remains: for vegetables, to thrive, must receive azotized aliment by their roots. We thus come to apprehend that plants supply animals with their azote, and that these restore it to plants when the term of their existence is accomplished; we are led to discover, in a word, that living organic matter derives its azote from dead organic matter.

This view leads us to conclude that the amount of living matter on the surface of the globe is restricted; that its limits are in some sort determined by the quantity of azote in circulation among organized beings; but the question must be viewed from a loftier eminence, and we must ask what is the origin of the azote which enters into the constitution of organic matter considered as a whole?

If we now turn to the possible sources or magazines of azote, we shall find, setting aside organized beings and their remains, that there is in truth but one, the atmosphere. It is therefore extremely probable that all living beings have previously obtained their azote from the atmosphere, just as it seems very certain that they have thence derived their carbon.*

The most reasonable supposition in the actual state of science, is to consider the ammoniacal vapors diffused through the atmosphere as the prime source of the azotized principles of vegetables, and then through them of animals; a consequence of which hypothesis would be to assume with Liebig, that carbontate of ammonia existed in the atmosphere before the appearance of living things upon the face of the earth.

The phenomena and effects of thunder-storms appear to me calculated to support this opinion. It is known, in fact, that so often as a succession of electrical sparks passes through moist air, there is formation and combination of nitric acid and ammonia. Now nitrate of ammonia is one of the constant ingredients in the rain of thunder-storms. But nitrate of ammonia, being a fixed salt, cannot exist in the atmosphere in the state of gas or vapor; and then it is not the nitrate, but the carbonate of ammonia that has been signalized in the air. In bringing to mind the series of reactions of which I have spoken, it is not difficult to perceive how the nitrate of ammonia, precipitated in thunder-showers, and thus brought into contact with calcareous rocks, should suffer decomposition, pass into the state of carbonate on the return of fair weather, and become fitted to undergo diffusion in the state of vapor through the atmosphere. We should in this way be led to regard the electrical agency, the flash of lightning, as the means by which the azote of the atmosphere is made fit for assimilation by organized beings. In Europe, where thunder-storms are rare, an office of so much importance will perhaps be accorded reluctantly to the electricity of the clouds; but in tropical countries no difficulty would probably be felt on the matter. In the torrid zone, thunder-storms happen in one place or another not only every day, but every hour, and even every minute of every hour throughout the year; so that an observer, placed at the equator, were he endowed with organs of sufficient delicacy, would never lose the roll of the thunder.

As the equator is quitted, the times at which rain falls become less specific or periodical. Under the tropics, the rains of thunder-

* Boussingault, *Annales de Chimie*, t. lxxi. 1839.

storms which are always the most copious, fall while the sun is in the neighborhood of the zenith. In the northern hemisphere, the greatest quantity of rain falls during winter; and at places somewhat far south on the temperate zone, the summer rain is altogether insignificant. In assuming the number 100 to express the whole annual quantity of rain, we should have in

	Madeira.	Lisbon.
Winter - - - - -	51	40
Spring - - - - -	16	34
Summer - - - - -	3	3
Autumn - - - - -	30	23

Less rain falls in the eastern parts of Europe than in the western. The annual rain, too, is distributed very unequally over the different seasons, as has been shown by M. Gasparin in a remarkable paper. If we express by 100 the quantity of rain gauged in a year, we should have for each season:—

	In the west of England.	West of France.	East of France.	Germany.	St. Petersburg.
Winter - - - - -	26	23	20	18	14
Spring - - - - -	20	13	23	22	18
Summer - - - - -	23	25	29	37	37
Autumn - - - - -	31	34	28	23	30

The quantity of rain which falls in the course of a year varies considerably according to the climate; to form an idea of the extent of these variations, it is enough to notice the results obtained at different observatories; but it is less the annual quantity of rain that falls, than the way or quantities in which it is distributed over the different months of the year, which interests the farmer; upon this distribution, in fact, in many districts, depend the productiveness and fertility of the soil. I add a table of the mean quantities of rain in inches and 10ths, that fall at London in the different months of the year:

Jan. in.	Feb. in.	March. in.	April. in.	May. in.	June. in.	July. in.	Aug. in.	Sept. in.	Oct. in.	Nov. in.	Dec. in.
1.45	1.25	1.17	1.29	1.61	1.72	2.39	1.80	1.84	2.08	2.20	1.72

[To be Continued.]

PROCEEDINGS OF THE STATE AGRICULTURAL SOCIETY OF SOUTH-CAROLINA.

*At its Semi-Annual Meeting, held at Newberry Court House, on
Wednesday, the 30th July, 1845.*

The Society met at Newberry Court House, as appointed by the meeting in December last.

The President, Hon. W. B. Seabrook, being absent, Hon. J. B. O'Neill, Vice-President, took the chair and organized the meeting.

The Chairman then read a letter from the President, W. B. Seabrook, stating his inability to attend from sickness. He recommended the following Committees to be appointed:

1. Committee to be appointed to ascertain and report the quantity of cotton and provision land marled and limed in '44 and '45, and the success of the application.

2. A Committee to report the best manure for cotton and provision crops, and how to be applied; also to report the actual practical difference between planting largely and manuring *lightly*, and planting *less* and manuring *higher*.

3. Committee of inquiry, as to the best grasses that the fitness of our climate will admit of, for black cattle, horses and sheep, and whether a large portion of the upper Districts may not profitably be converted into sheep pastures.

4. Committee to report on the quantity of bagging and roping, osnaburgs and other fabrics used by the planter, manufactured in South-Carolina, and the quantity of each which the necessities of the State require.

5. Questions similar to those propounded to the Agricultural Societies of Spartanburg, Greenville and Pendleton, to be put to the Newberry and adjacent District Societies.

6. Would it not be advisable to hold the extra meetings of the State Society in April or May, instead of a later period?

W. B. SEABROOK.

The Secretary then read a summary extract of the proceedings of the meeting in December last, referring to this meeting—the following to wit:

"On motion of Hon. J. B. O'Neill, it was agreed that a committee upon the communication of F. W. Davie, to the Hon. George M'Duffie, W. M'Willie, and W. D. Seabrook, and the following committee were appointed, viz: Geo. M'Duffie, W. M'Willie, J. B. O'Neill, and Wm. J. Alston."

The above being read, the Hon. J. B. O'Neill read a report, which was unanimously received. (*See report annexed.*) Other reports were read and received.

The following committees were now appointed to make the awards on stock:

Committee on Horses—Hon. A. P. Butler, Col. Richard Griffin, John Gaskins, Jas. M. Taylor, P. Ludlow Calhoun, B. F. Griffin, M. T. Mendenhall.

On Jacks and Mules—Maj. Wm. Eddins, Wm. E. Hardy, J. T. Whitfield, Dr. Harrington, George Boozer, J. M. Young.

On Cattle—Dr. J. B. Davis, F. B. Higgins, David Hents, W. H. Griffin, Edward Means, George W. Taylor.

On Sheep—James Creswell, Micajah Suber, J. H. Hunt, R. A. Griffin, Col. Wm. Counts.

On Swine—Dr. George W. Glenn, Wm. Summer, Dr. Peter Moon, Gen. Kinard, Thos. H. Pope.

Thursday Morning, July 31.

The Society met at 10 o'clock, by appointment. The proceedings of the meeting of Wednesday being read, the meeting adjourned to the inspection of the stock.

In this there was no apparent improvement, in the usual exhibitions of the Society, except in horses and mules. The display of horses surpassed considerably any former exhibition. The extraordinary distress of the farmers, was represented as the cause of failure in hogs and sheep—that of cattle being respectable.

All being minutely inspected, and great difficulty and delay on the part of the Committee on horses, they finally re-assembled, and when organized, the following reports were read:

The Committee on horses beg leave to report that the superiority of the animals exhibited for premiums, caused much hesitancy in deciding, but agree upon the following awards:

For the best Stallion for "*Harness purposes*," we make the award to Col. Whitfield's bay stallion, *Waverly*, by Bertrand, dam by Blackburn's Whip—Judge O'Neill's ch. stallion, *Tetotaller*, by John Gidron, dam Rob Roy mare, the most formidable competitor.

For the best stallion for "*Saddle purposes*," to Maj. Eddins' chesnut horse *Chrichton*, by Bertrand, dam by Phenomenon—the most formidable competitor, T. H. Henderson's *Woodpecker*, by Woodpecker.

For the best Mare for Harness purposes, to Washington Floyd's mare *March*, by Murat, dam by Bedford—Maj. Eddins' *Ajarah Harrison* the most formidable competitor, by Eclipse, dam by Gallatin.

For Saddle purposes, we make the award to Maj. Eddins' mare *Ajarah Harrison*—the most formidable competitor, Mr. Leverett's mare *F. Ellsler*, by Sumner, dam by Timoleon.

For the best Suckling, we make the award to John H. Pearson's colt, by Wilgo, dam by Bertrand.

Your Committee might notice, appropriately, several of the animals exhibited, but not wishing to consume time, respectfully report as above.
R. GRIFFIN, *Chair'n*.

The Committee on Cattle beg leave to report that they have carefully examined the *fine* specimens of cattle presented for their inspection, and recommend the following awards:

For the best Bull, over 3 years of age, to Dr. P. Moon, for his Durham, bred by Col. Hampton.

For the best Milch Cow, to Maj. Eddins, for his Durham cow, bred in Kentucky.

For the best Heifer under 3 years old, to Russel Gibson, for his Durham Heifer, bred by himself.

For the best suckling Calf, male or female, to Washington Floyd, for his Durham calf, bred by himself.

Your Committee had some hesitancy in making the above selection over the specimens exhibited by Mr. Hunt, Suber, Dr. Bobo, and Mr. Scott, but agreed upon as reported. Respectfully,

J. B. DAVIS, *Chair'n*.

The Committee on Sheep, beg leave to report, that they make the following awards:

For the finest Ram, to Maj. Eddins, for his Bakewell Ram, bred by Col. Hampton.

For the finest Ewe, to Maj. Eddins, for his Bakewell Ewe, bred by Col. Hampton.

For the finest pair of Lambs to Col. A. G. Summer, for his Bakewell pair bred by Col. Hampton.
J. CRESWELL, *Chair'n*.

The Committee on Hogs beg leave to report, that they award

To John Gaskins, for the best Boar, (Berkshire)

To G. T. Scott, for the best pair of Pigs, (Berkshire.)

G. W. GLENN, *Chair'n*.

The Committee on Jacks and Mules, beg leave to report that they have examined these, and were delighted with the excellence of all, but award

For the best Mule, to David Hents, bred by himself.

For the best Jack, to J. H. Hunt, (Imp.)

Respectfully,

W. EDDINS, *Chair'n*.

These reports being concurred in, his Honor Judge Butler, was invited to deliver his address, which he did, much to the gratification of the Society, and on motion of Col. Fair, the thanks of this Society were returned to Judge Butler for his able and instructive address, and that he be requested to furnish a copy for publication, which was unanimously agreed to.

Col. A. G. Summer moved that the President be requested to appoint a committee of nine, whose duty it shall be to collect information, and report through the public prints, such facts and opinions as will lead to the bestowal of more than ordinary attention on such fall and winter crops as may render the citizens of the State less dependant for subsistence on the present unpromising crop. Agreed to.

Resolved, That this Society deeply regret the dispensation of ill health which has deprived them of the valuable services of the President, Mr. Seabrook, and the 3rd Vice President, W. Brooks, Esq. They have, however, been highly gratified with the interest, which, in their letters, they have displayed in this meeting; and they hope, that by the blessing of God, the cause which prevented their attendance here may be removed, and that they will be restored to their accustomed places of usefulness in South-Carolina. Agreed to.

On motion the Society adjourned in good harmony.

J. B. DAVIS, *Rec'g. Sec'ry.*

—
Report on the scheme of reducing the quantity of cotton grown.

The Committee to whom was referred the communication of Col. Davie, addressed to the Hon. Geo. M'Duffie, W. M'Willie and W. B. Seabrook, report—

That they have considered Col. Davie's scheme of a combination among the cotton planters, to reduce the quantity planted, and thus enhance the price. They regard it, in the first place, as impracticable. The habits of planters are those of separate action: they combine less than any other class of men. Each regards his plantation as his empire: he looks around and considers what will best promote his individual interest; and though there is no doubt that many might be induced to meet, consult, and possibly write in favor of Col. Davie's project, yet some, and probably a great many, would prefer separate action, and thus destroy the scheme in the very outset.

The vast number of persons engaged in planting cotton in the Southern and South-Western States, renders the whole project impossible. What may be our interest in South-Carolina, might not, and very probably would not, be the interest of the planters in Alabama, Mississippi, Arkansas, Louisiana, Florida and Texas. Their means of raising immense crops make them insensible to *that* which presses upon us with so much severity.

In the second place, your Committee are persuaded, that if such a scheme were practicable, it is by no means desirable that it should take place. For, in its most favorable action, it would in the end, operate very much to the injury of the cotton planters. If, by a reduction of one-half, in the production, the price be raised one or two hundred per cent., the next season the quantity raised would be greatly increased, which would again reduce its value to a ruinous extent. Nothing can have more disastrous effects upon planters than this fluctuation from low prices to high, and from high to low. All which is necessary to our prosperity is a diminution of our wants,

and a near approach to certainty, in the market value of cotton. Whether it be high or low is of little consequence. Every thing will soon conform to it. From the cheapness and superior quality of our cotton, it has possession of the English manufactures in the ratio of nine to one. In the course of a few years, if we continue to increase the quantity, we shall in a corresponding increasing ratio, diminish the production in East Indian and South American cotton, and at length, fairly drive all competition from the field, and thus secure a monopoly of cotton in the markets of the world. This will give security to our domestic institutions. For, as soon as the world feel that they are dependant on us for the cotton manufactured and worn by its millions, there will be no disposition to take from us our laborers, and thereby prevent the supply of so necessary an article.

But if we do not grow the quantity now exported, and keep pace with the increasing population and consumption of the world, the vacuum will have to be supplied by other nations. On looking at a statistical table, hereto annexed, it will be seen that almost every bale now exported is annually consumed in manufactures. This being so, it follows, that the supply by us, or others, must meet the demand. This may be illustrated by reference to the state of things in the British West India Islands. The act of emancipation withdrew an immense amount of effective labor from the cultivation of sugar: it of course diminished the supply from them, but increased it in Demerara and Louisiana. The object of Great Britain in liberating her slaves was to pave the way to general emancipation in the West Indies and North America. So far she has failed in accomplishing it, and indeed at present, it looks, from her importation of Africans and East Indians, as if she was half way repenting her folly. But we can render no more efficient service, in accomplishing her cherished object, than by diminishing our production of cotton. When we shall do so, her East Indian provinces will come into the market, and supply what we have failed to do. Let her once turn the current of trade, and give the monopoly to the East Indies, which we now have, in a short time we shall be driven from the field, and then where is slavery? Our negroes will be valueless, and a burden, and of course their owners will cease to hold them.

Your Committee are fully convinced that there is not now, as is supposed, an over-production of cotton; for there cannot be an over-production of an article which is annually consumed. That this is the case with cotton, appears from the statistical table.

The situation of distress in which we have been, and possibly still are, is not the result of over-production. It resulted from the visionary speculations of great financial and commercial schemes. Many indulged in fancies, illusory as the South Sea scheme, and to the full as impossible, as the discovery of the famous *el dorado*. Such men gave to every thing a fancied value, which increased as their imaginations expanded—credit was unnaturally extended,

until debt exceeded every possible means of payment. Hence the revulsion of '37 and '38, and the prostration of much real, but more fancied wealth.

At the present moment we are recovering from *that*, by natural and proper means. Our cotton at low prices is paying annually our debts, and compelling us to reduce our luxuries, and to pursue a just economy. The currency is gradually expanding through the operations of our well regulated banks, so as to meet the wants of the people, and had it not been for the unprecedented drought and consequent loss of crops, wherewith it has pleased God to visit us, we should, in the next year, have reached a point of comparative safety and ease from the past pressure.

The extension of the production of cotton is met by a corresponding demand. Nearly one half of the population of Europe, especially France and Germany, have not now the comfort of a cotton shirt or cotton jacket. It has therefore, this field as an untried market, but one which is every day opening more and more to our enterprize. To this must be added, that perseverance on our part will drive all competitors from the field, and when they turn their attention to some other branch of business, they must become our customers. Our American cotton, and very probably our American manufactures, are in time, and that a very short one, to be used by every civilized inhabitant, and also many a savage one, of the world.

But if the production of cotton in the North American States was diminished one-half, the amount of misery which it would cause can hardly be realized. The cotton planter supports millions of human beings, and clothes hundreds of millions more. Let him extend his philanthropic labors; he will be benefited by them: and countless thousands will call him blessed. *At this time*, every indication points to an increase of price, such as the opening of the Chinese trade, the general soundness of the currency, abundance of poor in England, the possible repeal of the duty on raw cotton in every country, arising from competition among the manufactures, and the unprecedented demand for machinery in England, on the Continent, and in this country. To these encouraging circumstances it must be added, that probably the Tariff which has been to us the *source of so many troubles*, will, in a short time, come down to the Revenue standard. The evils under which we labor are not those of overproduction. They arise from two other causes: one is that of overlegislation. Give us free trade, abolish the unnatural burdens which nations have imposed upon one another: in a word, let the planter be free, and his comforts would soon be duplicated. If the grower of cotton could send his crop of cotton to any part of the world, and receive in exchange for it, commodities subject to a moderate duty, your Committee believe that the demand for American cotton would be increased to four millions instead of two millions of bales. This we would be unable to furnish, for the land adapted to its growth is greater in quantity than will ever be cultivated, *the number of laborers is limited*. Unless the African slave

trade be again opened, or the introduction of slaves from the West Indies be permitted, (of which no one dreams,) and increased cultivation can only arise from the withdrawal of laborers from the cultivation of rice, tobacco, and sugar, (than which nothing is less probable, especially in reference to the latter article,) an increase in population, and improved modes of cultivation. These sources of an increase of production, are so limited, that they never can meet the demand which would arise from free trade. We agree with a late writer, that "the American tariff is the origin of all the hostility of foreign nations to the institutions of the South." It is clear to our minds, that there can be no improvement in the business of planting, until this unnatural hostility and its cause be removed. For, every Southern planter feels his want of security, and the effect of this is increased upon him by the belief, in the non-slaveholding States, that slavery is to soon perish by its own weight. Let him and all others feel that he is secure in his property, and it will quadruple his energy and success.

Another cause of our distress is, that in a large portion of the southern country, cotton is cultivated, when its production does not now, and never can, at all compensate the planter for the labor bestowed. *Then* it is desirable for every one, that other branches of industry should be pursued. In such sections, manufactures may be most profitably substituted, and every manufactory established will be not only additional wealth to the proprietors and the country, but will also materially aid the cotton planter by increasing the consumption.

We do not intend to encourage the cultivation of cotton to the neglect of the other products necessary to support or comfort. Every planter should promptly render himself independent, in reference to those articles which could be produced on his plantation. In this way he would profitably curtail the quantity of land devoted to the cotton crop. An abandonment of the present extremely defective mode of culture, and the substitution of a better, would insure a larger quantity of cotton than would be lost by diversifying the products of industry. In other words, his cotton crop would be larger, his corn, wheat, rice, oats, barley, horses, mules, hogs, cattle, sheep, butter and vegetables, would be the produce of his farm.

If, however, the cotton crop is to be given up one half, after all the reductions of it which we have sanctioned, to what else can the planter of the South so profitably turn his attention? To grain? He already *in ordinary years*, produces twice as much as the Middle States, and about one-eighth more than the West. In Indian corn alone, the produce of the South, by her last census, was 300 millions bushels. If the planter of cotton is engaged in an unprofitable business, much more is the grain raised. The interest on capital invested in agriculture at the North, is less than 3 per cent.; *here* it is about 4 per cent. That the rice and tobacco culture might be profitably extended in this State, and will be in the South-West and Texas, is true. Millions of acres in South-Carolina, including

the lower country, are admirably adapted to the raising of rich grasses. This might be added as another branch of industry, from which reasonable profits could be realized, and might very well be added to the cotton planters' income. The business of tanning, and the manufactures of leather, might be and ought to be enlarged. In this State, all the means of a successful pursuit of this branch of industry are at hand, and within the reach of every one. Hides, lime, bark, and mechanics, (slaves,) are abundant. A few years ago, the capital engaged in this branch of industry in Massachusetts, was \$14,000,000, while that of cotton was \$13,000,000, and wool, less than \$11,000,000.

Another great inducement to South-Carolina to persevere in the cultivation of cotton, (where, in reference to quantity, it can be advantageously grown,) is that, it is now highly probable that very many planters in Mississippi, Louisiana and Texas, will in future direct their attention to tobacco and sugar. Their lands are well adapted to these productions, and the reduction of the duty on American sugar in Great Britain is one strong reason why the culture should be extended.

For these reasons, your Committee disapprove of any scheme which would have a tendency to materially abridge the quantity of cotton produced. Indeed, they trust that it will continue to increase, and carry its blessings as it were on the wings of the wind, until every inhabitant shall fully realize the benefit of cotton fabrics for all the purposes to which wool, flax, silk and hemp, have been heretofore devoted.

W. B. SEABROOK.

JOHN BELTON O'NEALL.

Col. M'Willie's absence from South-Carolina, and Mr. M'Duffie's ill health, prevented the Committee from enjoying the benefit of their services and council. Mr. Alston concurs in the entire report except a single sentence: and his reasons for that dissent are apprehended.

I concur in the opinion that Col. Davie's plan of reducing the cotton crop, by obtaining an agreement among the planters to plant one-half or two-thirds of a crop, is impracticable.

I also believe that it is the true policy of the Southern or cotton growing States, to retain, by all means in their power, their ascendancy in the cotton markets of the world, and to do nothing calculated to encourage the extension of the growth of cotton in other portions of the world.

I however, disagree to the opinion that "there is not now an over-production of cotton." I am inclined to believe that the low prices are to be ascribed *mainly* to the heavy crops. It is familiar to all who have been in the habit of attending to the accounts brought from Europe by the different arrivals of vessels, *that the prices there are controlled principally by the latest accounts from this side of the*

water, of the prospects of the coming crop, or the probable amount of the supply of cotton from the United States. If the latest accounts from America had been, that the prospect was good, or in favor of a large supply, then the prices there (in Europe) fell, and *vice versa*.

And these accounts from America seem to have a greater control than all other causes combined. The reduction of price of the raw material, induces, to some extent, an increase of the consumption, by enabling the manufacturer to make and sell the manufactured goods a little lower. But when we consider how little must be the cost of the raw material contained in a yard of heavy cotton goods—even at 10 cents per pound of the cotton, we cannot suppose that the price of the raw material can have much influence in increasing or diminishing the consumption, unless the price should be much higher than it has been for many years. Take the cost of the raw cotton in a yard of manufactured cotton goods, (even at 10 cents per pound,) from the price of that yard of goods, and it will show, that if the consumption is governed by the price of the manufactured goods, it is mainly by the cost of the manufacturing—not of the raw material.

It seems to me that if the consumption kept pace with the production, the price would not be affected by it either way, to any great extent; but that if the manufacturer had always found a ready market for his goods he would have continued to purchase the cotton at the usual price, and therefore there would be but little variation in the price of cotton. On the contrary, however, the manufacturer could not obtain a market for his goods—they would accumulate upon his hands—he would be compelled to reduce the wages of his operatives, or stop his manufacturing machines. He could not afford to buy cotton any longer, unless at reduced prices, and in less quantities. There being difficulties in getting off manufactures, unless at reduced prices, a like difficulty in selling the raw cotton would be produced, unless at reduced prices. The prices then must come down.

I will not extend my remarks. The report, in other respects, I concur in. I would prefer that portion, or sentence, stricken out, as I am inclined to think that its omission would not be inconsistent with the rest of the report.

Respectfully,

W. J. ALSTON.

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Import of Cotton, expressed in 1000's of bales.

From	1841.	1842.	1843.	1844.
United States,	1387	1534	1904	1682
Brazil,	100	104	115	123
West Indies,	72	72	49	47
East Indies,	324	316	227	299
Egypt,	123	108	469	126

Stocks imported, and consumption of Cotton in Europe, reduced to bales of 300 lbs. each.

	Imports.	Consumption.
1841,	2,291,010	2,215,026
1842,	2,477,266	2,422,926
1843,	2,949,000	2,654,000
1844,	2,736,843	2,667,469

From the above, it appears that in 1841, the imports exceeded the consumption, 75,984; 1842, 54,340; 1843, 295,000; 1844, 69,374 bales.

Stock 1st of January.

1841.	1842.	1843.	1844.	1845.
777,610	863,421,	926,102	1,239,000	1,321,726

Total deliveries, from which are deducted intermediate shipments, or surplus of exports from Great Britain; also the stock on hand, 31st Dec., and to which are added the stock on hand, Jan. 1st, expressed in 1000's of bales :

1841.	1842.	1843.	1844.
1846	2005	2155	2127

Importation.—It will be seen (says the Circular,) that there is a decrease from the United States of about 200,000 bags, and from Egypt of 60,000 bags, whilst from the East Indies is an increase of 55,000 bags, and a trifle from the Brazils, which leaves, on the aggregate, a deficiency of about 200,000 bags; but the excess in the stocks at the beginning of the year, made up the aggregate supply fully to what it was in the previous year.

The above is extracted from the Circular of Collman & Stotterfoght, dated Liverpool, 31st January, 1845.

[Columbia, South-Carolinian.

CULTIVATION OF AMERICAN COTTON IN INDIA, A FAILURE.

Extract of a letter from the New-York correspondent of the Washington Union.

"New-York, Sept. 22, 1845.

The Zenobia, which arrived at this port on Saturday morning last, from Calcutta, East Indies, brought home one of the American cotton planters, who some five years since, entered the service of the Hon. East India Company, as a superintendent of cotton farms, in their extensive experiment made to grow American Cotton in that region, and to improve the cultivation of native cotton. I have had much conversation with Mr. T., who went from Mississippi; and after having served the Government for five years, the term of his engagement, has returned as stated, in the Zenobia. He has communicated to me much valuable and interesting information in relation to India.

He estimates the experiment has cost the government about \$500,000, and that it has resulted in the most complete and signal failure!

In 1840, an agent of the Government came to the United States, and repaired to Louisiana and Mississippi, where the growing of Cotton has been carried to the greatest state of perfection, and where he engaged ten Americans, who had been employed in superintending Cotton estates in that section of the Union for several years. They were well recommended by the most respectable planters. They left with the agent for India, via England, and took with them large quantities of the best American cotton seed, agricultural implements, cotton gins, presses, &c.

The planters were engaged at an average salary of about £300 each, with an allowance for subsistence of £100 more. Each entered into a contract to remain in the service of the Company five years, and to conduct the experiments in such parts of India as the Government should point out. Of the ten persons thus engaged, three after the first year returned home, being paid their salaries up to the time of leaving, but were left to bear their own expenses home; while, according to the agreement, those who remained five years, were to have all their expenses borne from America to India, and from thence, at the expiration of the service, back to the United States. Seven of the party remained to the end of their engagement—one of whom is Mr. T., who has just arrived in the Zenobia.

He says, on reaching India, their party were distributed to different parts of the Indian empire, in order that the experiment might be tested in reference to the different soils and varieties of climate in the vast empire.

One (Mr. T.) was placed at Calpee, in the district of Bundelcund. Another was stationed at Goruckpore, under the Napal hills; another in Dooab; another was located in Soomapoore; another at Hume-poore, in the province of Banda; another at Raatch, in Bandelpore; another in Colmbatore and at Surat, on the western side of the peninsula.

After experimenting a year or two at each place, without prospect of success, they were changed to other localities, so as to give every district in India, as far as possible, a trial. Mr. T. was changed from Bundelcund to Rungpore, Northern India; near the base, and in full view of the Himmaleh mountains, which were covered with perpetual snow. Others were changed to Dahwar, in the Southern Mahratta country.

The American planter placed at Raatch, during a rebellion which commenced with the Decoys, (robbers,) had his premises attacked, his houses sacked and burnt, barely escaping with his life and the clothes he wore.

In every part of India where the Americans tried the cultivation of cotton, and endeavored to instruct the natives in the best mode of culture, they most signally failed! Those who remained used every possible exertion to succeed, as they were liberally paid, having

every facility granted that they could ask, with the expectation of being handsomely rewarded if they succeeded.

Mr. T. thinks the two great and insuperable difficulties, in the way of cultivating cotton in India, are attributable to the two great extremes of dry and wet weather, either of which is peculiarly fatal to cotton. During the continuance of the rainy season, the cotton plants begin to grow with unwonted luxuriance and rapidity, to be as suddenly checked and cut off by the intense heat of the sun, which pours upon them during the succeeding dry season. When the dry weather sets in, the sun ripens the bolls prematurely, when apparently not more than half grown, while the leaves of the plant are crisped and burnt to a brown color by the intensity of the solar heat.

In lower Bengal, the rainy season commences late in May, and continues till October. In central India, the rainy season begins about the middle of July, and lasts till from the 1st to the 15th of September.

In lower Bengal, as much as seventy-six inches of rain usually falls in twelve months. In central India, no crops can be anticipated with much less than thirteen inches of rain. Eleven inches never fails to result in a famine, which is dreadful in its effects upon the natives.

In addition to the unconquerable difficulties of the climate, the cotton plant is exposed to the fatal attacks of destructive insects. There is one, which lays an egg in the flower of the plant. Before the boll matures, the worm forms within it, which feeds upon the green and tender fibres of the cotton, eating out all the cotton within the boll before it matures; leaving only a lock or two in some bolls, or pods, while, in others, not a fibre is left. In some parts of India it is also subject to the attacks of white ants, which cut down the plants while young, or attack the young pods, and cut them off.

All that the Americans could do, with their best exertions, only enabled them to raise, on the average, about ten pounds of clean cotton to the acre, from the best American cotton seed, and only seventy pounds of clean cotton to the acre from native India cotton seed.

Mr. T., before leaving Mississippi to go to India, superintended a cotton estate near Rodney, in that State, in 1839, on which he raised over nine hundred pounds of clean cotton to the acre! He says, that year he made a fine crop, actually sending to market two hundred bales of good cotton, averaging four hundred and fifty pounds each, from ninety-six acres of land! What a contrast, this, to cropping in India!

Mr. F. one of the American cotton growers who went to India, and was stationed at Goruckpore, put two hundred acres in cotton, from which he gathered only two hundred pounds of clean cotton! The most these sent to Colmbatore could do, was to raise in a favorable year, two hundred pounds of seed cotton to the acre, equal to about fifty pounds of clean cotton! The most Mr. T. could do, was to raise, the first year, ten pounds of clean cotton

from American cotton seed of the Mexican variety, (the best,) and seventy pounds of native cotton to the acre. He says the American seed carried out from about Rodney, (the best in America,) deteriorating every year; the staple or fibre growing shorter, while the yield grew less.

It is his firm conviction, that if the American seed be planted over and over again in the same soil, in India, in *five years* it will totally cease to mature any cotton whatever! He also says, by changing it to other districts, it may be made to yield something a few years longer, but would ultimately run out.

The *New-York Sun* calls the cotton fields of the South, our "shield and buckler against foreign aggression." The cotton experiment in India having failed of success, the United States must, of course, be the great source and fountain of this staple for other nations, and consequently furnish employment for millions in other countries than our own.

[N. Y. *Far. & Mec.*

NEW KIND OF COTTON.

Mr. Hugh F. Longing, living in Henry county, on the Towaliga, eight miles from Griffin, brought to our office last week, a stalk of cotton, which he calls the New Orleans or Money-bush cotton, which he stated grew on second quality upland, now twenty years in cultivation without manure. The bush was literally covered with pods. He stated that he should gather from the field planted, at the rate of 1500 pounds to the acre, while a patch of the common kind, alongside of it, on the same kind of soil, with the same attendance, would not produce more than 400 pounds to the acre. His brother, last year, planted in Harris county, fourteen acres of the same kind of cotton, on second quality gray, post-oak land, and gathered from 2000 to 2500 pounds per acre. We are no planters, and know but little about planting, but the difference is so large and striking, that we think this cotton should command public attention. Mr. L. will have some of the seed to spare, at one dollar per bushel.

[Cassville (Ga.) *Pioneer.*

THE SILK PLANT.

Letter from Dr. Joseph Johnson, of Charleston, S. C. "On the Silk Plant." &c., to Francis Markoe, Jr. Esq., Corresponding Secretary of the National Institute. From the *National Intelligencer*, of October 11, 1845.

Dear Sir:—I read with pleasure, in Mr. Skinner's July number of the *Agricultural Journal*,* a letter of D. Smith M'Cauley to you, from the Consulate at Tripoli, relative to the vegetable silk cultiva-

* Published in the *Southern Agriculturist* of September, page 352.

ted in that country, of which he also sent the seeds and a drawing of the plant. I have now the pleasure of presenting a specimen of the plant, with its flowers and fruit, produced by cultivation on the Agricultural Farm, near Charleston, South-Carolina.

In March, 1844, I received a letter from the Rev. Mr. J. B. Adger, Missionary in Smyria, Asia Minor, from the Presbyterian Church in the United States, and with it were various seeds, which I distributed among gentlemen most likely to take an interest in their propagation. Among them were the seeds of this plant, marked *Asclepias*; but, if I remember rightly, not designating the species: no mention was made of its uses or value. Some of the seeds I placed in the hands of Mr. Joseph O'Hear, Superintendent of the Agricultural Farm, and requested his care and attention to them. When your letter appeared in print, Mr. O'Hear not only had the plant itself in flower, but on it were some cocoons or seed-pods perfectly matured. He called upon me with them, and said that the plant did not flower the year before, but that the stem and root had survived the winter in an open exposure, and commenced bearing early in the summer; that he had lost the paper with its name, and could not have identified it but for the excellent drawing of the plant in Skinner's Journal. The paper with the name had been staked in the row when he sowed the seed to designate it, and was lost in the exposure to the weather. He told me also that eight or ten additional stems had sprung up from the roots, most of which had matured their fruit or pods. When I saw the plants the season was late and the flowering over, but I obtained a few flowers with the other important parts of the plant which I now enclose for the examination of yourself and friends.

When first matured and fresh, these follicles or pods resemble the cocoons of silkworms as much as a vegetable production can be expected to resemble an animal production. The plants being too much crowded, Mr. O'Hear intends transplanting the stems and placing them about eight feet apart; the seeds he will distribute among the Agricultural Society.

I have no doubt that the plant has been described and named by European botanists, but I have not met with any satisfactory description of it—it certainly is not among the numerous species found in the United States. As it may interest others, I give the best botanical description that I could obtain, which, conjoined with Mr. Skinner's plate, will give a pretty correct idea of the plant.* It is a species of Swallow-wort, one of which is well known as the Trinket plant. In Turton's *Linnaeus* it is *Pentandria Digynia*, and we think comes nearest to his *Asclepias Linaria* of any other. The stem is simple, round, naked, and about five feet high; the leaves linear, channelled, in pairs, and crowded near the top; the flowers in small umbels, axillary, on long peduncles, yellow, nodding, petals very small, the horn not above the crown; the follicles ovate, a little pointed, ventose, thin, white, and spinous; the seeds numerous,

* We regret we are not able to give a copy of the drawing in our Journal, but will show it if called on.

black, oblong, and enveloped in a white silky wool, somewhat stronger in its fibre than the shining floss of the other species.

Mr. Adger also sent us the seeds of a most delightful species of muskmellon, called the Cassaba melon, from a district in which it is chiefly cultivated and sent to the Smyrna market. Cassaba is at the western extremity of Asia Minor, about mid-way between Constantinople and Smyrna, not far from the site of ancient Troy. I have seen these melons highly commended by English tourists of taste, thereby confirming Mr. Adger's preference—in Charleston they were decidedly preferred in flavor to all others. The melons from which the seeds were taken which I now send you were the produce of Dr. Thomas Legare's plantation, on James' Island, near Charleston, and carefully cultivated by him. They succeed best on a good garden mould, damp but not wet, and containing a little lime. They should not be located near other melons, gourds, cucumbers, &c., which may impair their flavor and vitiate the seed for a future crop.

I remain, very respectfully, your obedient servant,

JOSEPH JOHNSON

IMPORTANT TO AGRICULTURISTS—ELECTRICITY.

A communication was read at the late meeting of the Royal Agricultural Society, England, from Mr. La Beaume, in relation to experiments in quickening the germination of seeds, invigorating their plants, increasing their fecundity, and improving the quality of their products by means of electricity. "The means I have employed," says the writer, "are not atmospheric electricity, galvanism, or electro-magnetism, which cannot apply, but electricity, developed by a machine of adequate powers, and by a simple, peculiar and effective process, easily understood, and easily used, with very little manual labor. The time required is, on the whole, about half an hour, and a 1000 bushels of wheat, or any other grain, can be electrified as easily as an ounce, at the same time. I beg also to announce, that this my process applies equally to the resuscitation of the impaired vitality of old as well as bad seeds, to the revivification of withering plants, and to the increase of the quality and quantity of their fruit. In order to a more extended trial, and to the establishment of the facts I have communicated, if several members will send me some packages of turnip and other seed, I will freely and cheerfully electrify and return them in a day or two, so that success may be proved by an impartial trial, under your auspices; and I shall neither seek nor receive any other reward than your approbation, and the satisfaction of diffusion of practical knowledge for the public good." Further trials by Messrs. La Beaume, Earl of Essex, and others, were promised at the next meeting. We doubt not any American can readily try the experiment from the above notice,—its importance certainly should prompt them to do so at once.

[N. Y. Far. & Mec.]

For the *Southern Agriculturist*.

THE EFFECT OF DROUGHT UPON RICE LANDS.

BY DR. J. LAWRENCE SMITH.

As communicated to the South-Carolina Agricultural Society, by request of their President on the 21st October. The Society voted their thanks to the author, with a request that it might be published in the *Southern Agriculturist*.

The late season of drought is calculated to arouse the fears and awaken the attention of our rice planters; more especially those on Cooper river, who suffered seriously last year from the same cause, many losing their entire crops. Interest, if no other motive, should direct the planters to seek and apply every means, that may in any measure tend to obviate such disastrous results, which cannot but end in embarrassments of various natures.

If fresh water be furnished in sufficient quantity, there is no apprehension as to what the result of the crops will be; but this not being under our control, we become subject to the variable nature of the seasons, at one time making an abundant crop, at another time, losing every ear of rice. Want of water has been considered the sole cause of all this evil—but we ought to look farther into the matter; and it is for this reason that the attention of your Society is called to the following statement of facts connected with the subject:

The mere deficiency of water cannot *alone* be the direct cause of that complete destruction attending many of the crops both of this and last year; for rice planted upon sandy high-land (a rice differing but little from that planted in the swamps,) yields eight, ten, or even more bushels to the acre, and that too during an ordinary season; this I know to be a fact, having among other instances, seen it two summers ago in the northwestern part of Georgia—and besides, the inefficiently watered rice-fields of the Nile, afford another example on an extended scale. But the fact is, there is no necessity of going to Egypt to look for this, for with us not a year passes without rice growing on spots that water never reaches, except in the form of rain. It being admitted, as it must be, that the *mere deficiency* of water cannot be the only cause of the complete annihilation of any crop of rice; we must look to some other effects produced by a drought, than that of depriving the rice of a certain amount of moisture—to discover what this is, has been my effort

for some time past, and it has been attended with some success, both as to the effect, as well as to the means by which to correct it to an extent more or less great, according to the peculiarities of the different soils, and the dryness of the season.

In all of our swamp lands there exists, in more or less abundance, a substance called pyrites, which is composed of sulphur and iron. This fact any one may make himself acquainted with, by burning a portion of the soil, when the well known odour of burnt sulphur will be at once perceptible—there may also be a small portion of sulphur uncombined with iron, arising from the vegetable matter, of which it originally formed a constituent part. Whether this be the case or not, it is a matter of little importance, as the first substance mentioned (the pyrites) is sufficient of itself to explain what follows:—

This pyrite is constantly undergoing a decomposition, and combining with one of the elements of air and water, forming sulphuric acid and oxide of iron; at first these two substances are in combination under the form of the well known salt, copperas, which in its turn is either wholly in part decomposed by alumina, and a species of alum is formed. It would be useless to go into a minute explanation of how these changes are produced, it is sufficient in order to be understood, to have it known that the decomposition of the pyrites gives rise directly to the formation of copperas, and indirectly to that of a species of alum; *these salts are poisonous to vegetation and their formation is unavoidable.*

During all seasons, and in all soils, there is either a descent or an ascent of moisture, the one happening in wet seasons or just after a rain, and the other in seasons of drought; in the former case (a wet season) the roots of the plants imbibe nothing but fresh water, while in the latter (a dry season) they are effected by whatever impurities the subwater may bring along with it to the surface, if the ingredients brought up in solution are innoxious or nutritious, the plants flourish, if noxious, they are either injured or killed.

What has just been stated, is applicable to the rice field—for if we are furnished with a sufficiency of such water as may be applied to the land, the surface can be kept moister than the subsoil, and there will consequently be a tendency of the water to pass from the surface below, and in its passage, meeting with the copperas and alum, dissolves them and carries them further from the roots of the

plants. If the case be reversed, as during a dry season, when the water is too low or too brackish to be let on to the fields, and the surface becomes parched and dry; then it is in the subsoil that the water preponderates, and owing to the capillary action of the soil, (a property common to all porous bodies,) there will be an ascent of moisture towards the surface, which will bring along with it the copperas and alum in solution, the effects of which are so pernicious to vegetation.

It requires no scientific investigation or chemical analysis, to prove that this takes place in the way mentioned—a little observation can convince any one of the fact—for if we taste a little of the soil a day or two after the water has been drawn off, it will be found tasteless; on the contrary, if the same soil be tasted after a season of drought, a sweetish styptic taste is apparent—in fact, in many fields after a long drought, the salts in question will make themselves visible on the surface in the form of a whitish efflorescence—in other cases, spots of almost pure iron-rust are discernable, arising from the decomposition of the copperas. The ditch water of the rice-fields is subject to the same changes, almost invariably containing copperas during a dry season, or after being allowed to stand any length of time; a few oak leaves bruised, suffice to test this fact, by being added to a cup of the water, which becomes more or less blackened according to the amount of iron present. The ditch water also contains gypsum, which exists in the soil; it being formed from the decomposition of the copperas and alum by the natural lime of the soil.

The important facts then to be looked to are—First, the presence of copperas and alum in more or less abundance in many of our swamp lands. Secondly, the injurious effects of these salts upon vegetation; and thirdly, their appearance at or near the surface in dry seasons—this necessarily leads to the inquiry as to whether there is a remedy to this evil. It is beyond our control to arrest the formation of these salts, but fortunately we are not without the means of modifying their action near the surface, where the roots of the plant are seeking nutriment; and to this I would call the special attention of your Society, as to know the cause of the disease without the remedy, although it may be of interest to men of science, is certainly of none to farmers; in fact such a knowledge is sometimes worse than ignorance.

Much may be done by attending both to the culture of the rice and the application of certain substances to the soil; however, only those remedies will be alluded to that can readily be applied, commencing with the least important:

1st. By attending properly to the ditches and quarter ditches, making them in many cases deeper, thus draining more thoroughly that portion of the land above their level, and thereby preventing the water from below rising so readily to the surface.

2nd. Frequently overflowing of the land (while not under culture) and change of the water, will carry away the noxious salts of the soil, by first dissolving them—it is not meant to recommend here, that the flows shall *immediately* succeed each other, but it would be well that a certain space of time should elapse between the respective flows—when the water is slightly effected with the salts, I do not think that any apprehension need arise about injury to the land, while not being cultivated,

3rd. Method to be alluded to, is the burning of the land, which when dry, readily ignites and burns for some time. This acts beneficially by decomposing the copperas and pyrites—burning is not so bad a method as might at first sight be supposed, for although a great deal of vegetable matter is destroyed, there is much that can be spared; and moreover the important part is not lost, (the ashes,) this remaining in the soil—in many places this method could not be applied, from the deficiency of vegetable matter; but fortunately such lands are not apt to be effected in the way before alluded to.

4th. I now come to speak of the last and most efficacious method, one (situated as we are,) that renders the others superfluous—it is where a substance is applied that directly decomposes the copperas and alum—this substance nature has lavished upon us, for the very purpose as it were, of being applied to remedy these very evils that the lands are subject to—*marl* is what is here alluded to.

It has been mentioned that gypsum is found in many of the rice field soils, arising from the decomposition of the copperas and alum by the natural lime of the soil; but the quantity in most cases is too small to act upon the entire amount of these deleterious compounds. What lime we may add then, either in the form of marl or burnt lime, acts in the same way, forming gypsum by the lime combining with the acid of the copperas and alum.

A calculation has been made as to the quantity of copperas existing in an acre of one portion of Mr. Lowndes' place, on the Combahee river, (land on which rice will not grow,) and what amount of lime it requires to decompose it. The result of this calculation is, that in an acre of the land, one foot deep, there is four tons of copperas mixed with alum; and it will require to decompose it, about four tons of burnt lime, or ten tons of marl of 75 per cent. of carbonate of lime, which is equivalent to 300 bushels of marl, allowing 75 pounds to the bushel, corresponding to about 110 bushels of burnt lime. It may be well to state that the particular soil in question, may have but few parallels with regard to the amount of these poisonous salts, and there is no doubt that on most lands effected in this way, that an application of from fifty to a hundred bushels every four or five years, would improve them most materially; and that the excess of yield, would far more than redeem the expense necessary to be incurred.

It has been ascertained that those rice lands highest up the rivers, are (as far as observation has been made) freer from copperas than those lower down, and this no doubt arises from the fact, that they are older and have therefore undergone a more complete decomposition; if this rule proves general, the former lands will not require the same amount of marl as the latter.

I know it may be said that marl cannot replace the necessity of water, but it may save a crop a week or a month, until nature furnishes water; and it is not too much to say, that some of this year's crops might have been saved had the fields been marled; as the rice would thus have held out longer than it did for reasons already made known, and perhaps even until the river was sufficiently high and fresh to be let on to the land. I omit altogether speaking of other advantages arising from the marl than those just mentioned, as it would occupy too much of your time; and as short communications generally elicit most attention, I shall dismiss the subject, leaving it to planters to observe themselves the facts to which your attention has been called, and to make such application of the remedies as their judgment may direct.

AGRICULTURAL CONDITION OF PENDLETON.

ADVANTAGE OF THE PEA CULTURE IN SOUTH-CAROLINA.

There is perhaps, no section of country in the upper districts, which has improved more in Agricultural condition than the "Old Pendleton" neighborhood—the result we are told of an Agricultural Society, composed of intelligent and practical farmers. We were struck with the manifest improvement in the breeds of cattle and hogs. The Berkshire cross has here told well—for the very simple reason, we presume, that stock is attended to. We have never seen a finer stock of hogs, in travelling through any country. More attention seems to be paid to the Pea culture here, than in any section we have been. We are told that it is the opinion of many good farmers hereabouts, that land can be improved to a high degree, by the pea culture. We have no doubt of the fact, if properly applied. There is a pea, the Chickasaw pea, which bears most abundantly, and once planted, is almost inextirpable. We have seen it put into corn ground—after the corn was taken off—pastured by the cattle and hogs, all the winter—in the spring put in oats, and after the oats was taken off, the pea came up in great abundance. Now suppose these were to be let alone, and in lieu of the absurd system of pasturing stubble, the *vine* and *stubble* should be turned under in the fall—would not the land be vastly improved? We have no doubt—if the pea were sown on our stubble lands—a peck to the acre—and the crop turned in while in the bloom—that the effect produced would be equal to the best clover leys, so much esteemed in Virginia and at the North. It is an admitted fact, that leguminous plants exhaust a soil in a very slight degree.

The pea vine contains about 53 per cent. of potash, a most important ingredient in all soils, for the production of grain or cotton. If this should be returned to the soil, in addition to the carbon and nitrogen contained in the vine, it seems to me that there would be a manifest improvement. It has been discovered by analysis that cotton wool contains potassa 31.09 per cent.; lime, 17.05; magnesia, 3.26; phosphoric acid, 12.30; sulphuric acid, 1.22. That the seed contains phosphoric acid, 45.85; lime 29.79; potassa 19.40; sulphuric acid 1.16 per cent. While corn contains potassa 20.87; phosphoric acid 18.80; lime 9.72; magnesia 5.76 per cent. The following analysis of straws may not be uninteresting:

	Wheat straw.	Barley straw.	Oat straw.
Potash,	$\frac{1}{2}$	$3\frac{1}{2}$	15
Soda,	$\frac{3}{4}$	1	"
Lime,	7	$10\frac{1}{2}$	$23\frac{1}{4}$
Magnesia,	1	$1\frac{1}{2}$	$\frac{1}{2}$
Alumina,	$23\frac{1}{2}$	3	"
Oxide of Iron,	"	$\frac{1}{2}$	"
Silica or flint,	81	$73\frac{1}{2}$	80
Sulphuric Acid,	1	2	$1\frac{1}{2}$
Phosphoric do.	5	3	$\frac{1}{4}$
Chlorine,	1	$1\frac{1}{2}$	"
	100	100	100

From the foregoing data we learn that potash is a most important ingredient in cotton and corn, and that the pea vine and cotton seed would be most invaluable manures—how easy would it be to avail ourselves of both. If a planter should sow twenty bushels per acre of cotton seed, upon a luxuriant vine crop, and put it in wheat—is it not reasonable to suppose that the advantage derived would be as great as from a clover ley, and gypsum. We are sure the elements are nearly the same, and we have no doubt of its effect. It is an admitted fact, we believe, that oats exhaust land more than any other grain crop. The mystery is solved we think, by the analysis, for thereby, oats is found to contain 15 per cent. of potassa, while barley straw contains only $3\frac{1}{2}$, and wheat $\frac{1}{2}$ per cent. No doubt the rapid growth of oats, and close pasturing aids much in the exhaustion of the soil, and we derive an important lesson from the analysis—the want of potassa in the soil—which may be supplied by the pea crop, and the keeping off one's stock. Grass does not exhaust a soil, for the very simple reason that it takes up no potash. Grass contains carbon 45 per cent.; hydrogen 5; oxygen, 38; nitrogen $1\frac{1}{2}$; and ashes 9 per cent.

Every old woman in the country can tell us that post-oak and hickory contain the most potash—yet how few farmers know that this is the reason why post-oak and hickory lands are the most productive. Let a piece of land of this growth be exhausted and turned out, and it will put up pine, which contains less potash perhaps, than any other tree. For this reason an old pine field will produce but a few years without manure. In all old pine fields, you will find an abundant supply of silica, and if you only will add the potash, you are certain of a good crop.

We look forward to a day when the pea crop will be found a most important auxiliary in the resuscitation of the worn out lands of the South. Clover cannot be grown here—the climate is altogether too hot to expect a luxuriant growth to answer for manure. We see no resource left us but the pea culture.

PAUL PRY.

[Columbia, South-Carolinian.]

FUNGI, INSECTS, &c.—HOW TO PREVENT THEIR ATTACKS
ON PLANTS.

Mr. Editor :—The fact that the disease which has injured the potato crop so severely for several years past, has been attributed to the attacks of the fungi, by some highly scientific gentlemen, induces me to give you a few remarks on the *cause of the fungi*.

Close observation will show that all plants of the fungi tribe grow where there is a deficiency of alkalies. We never see mushrooms, toadstools, or anything of the kind grow on or near a heap of ashes, or lime. But we almost invariably see them growing on or near a

pile of stable dung, or any thing yielding a large proportion of carbonic acid. The cause of this is easily demonstrated by chemistry. A chemical analysis of plants of the fungi tribe, will show that they contain an extremely small proportion of alkali, far smaller than any other class of vegetables. The fact is of the highest importance to farmers; by its aid they can always tell when their soils need alkaline substances to make them more productive, without going to the trouble and expense of a chemical analysis of the soil for that purpose. Upon whatever spot of ground the fungi make their appearance, *there is a want of alkali*, and no time should be lost in supplying it, if we would raise profitable crops; for such crops as wheat, corn, oats, hay, potatoes, &c., will not grow well there even if they are supplied with the very best stable manure. They need ashes, lime, &c., in such places, *and they cannot do without them*.

The fungi being composed principally of carbon, oxygen, and hydrogen, feed upon carbonic acid and water chiefly, and consequently if lime or potash be added to the soil where they grow, and the carbonic acid be thereby changed into a salt, the fungi have nothing to feed upon, and therefore die, for they cannot feed upon a salt. When the potato crop has been furnished with sufficient alkali, particularly potash, and the carbonic acid in it is in the form of a carbonate, the fungi have nothing to feed on, and do not attack the potato. On the other hand, when there is *not* sufficient alkali given to the potato crop to cause the carbonic acid to form a salt by union with such alkali, then the carbonic acid in the potato is in its own form of carbonic acid, and as such the sickly root offers the proper food to the fungi, and it avails itself of it; unfortunately, for doing so, it brings down upon itself the charge of being the cause of the potato disease.*

The same is the case with other plants. If they lack alkali to form a salt in connection with the carbonic acid they receive, the superabundant carbonic acid will give nutrition to the seeds of fungi, and they will sprout and grow. We see this effect produced in wheat in the case of mildew, rust or blight, and also in smut in the same plant, the ergot in rye, the "devel's suff-box" in corn, the mildew in oats, buckwheat, and the grasses, and the mossy growth on the bark of fruit and other trees. This is demonstrated by the fact, that if we apply strong alkalies in sufficient quantities to any of these plants before they are attacked by the fungi, *they will not be attacked*; and if we supply them after they are attacked, *they will soon be freed from them*. It is to this purpose that our most successful farmers and fruit raisers apply salt and lime to protect wheat from rust, mildew or blight, and smut—and put ashes and lime upon corn to protect it from the "snuff-box"—and sow ashes on potatoes

* Some of the practical chemists of your city, with their balances, tests, &c., might do the agricultural community a great service in connection with this matter, by analyzing sound potatoes, and giving their constituents, and then analyzing the rotting potatoes, and giving their constituents also. The public might then compare them, and see what was wanted, and supply it: I would do so myself, had I the requisite materials.

to save them from the rot—and wash fruit trees with whale oil, soap or other alkaline substances, to restore them to health. These alkaline substances, too, by uniting with the carbonic acid, prevent the commencement of decay. This commencement, in all carboniferous substances, is called in chemistry, the “saccharine fermentation,” the product of which is a sweet substance, which gives food to flies, bugs, &c., and which flies and bugs are also charged by other scientific gentlemen, with being the cause of the potatoe rot, and other diseases of plants. The Hessian fly, in my opinion, finds nothing suited to its palate in a healthy stalk of wheat, or one that has enough alkali, and therefore does not attack it; but in a sickly plant, or one with a deficiency of alkali, she finds the sweet substance upon which she feeds, and there lays her eggs; which eggs, in the course of time, hatch and produce worms, and if the plant is in such a condition as to furnish food for these worms, they will still remain there; but a healthy plant will not furnish that food—the same in regard to the wheat-worm, muck-worm, and all other worms that attack plants. I am led to this conclusion, Mr. Editor, by numerous observations and some experiments. I have found that where there was the proper quantity of alkaline substances, plants were not injured by worms, bugs, or flies, in any other way than by being eaten up by them. And, indeed, they are not so apt to be eaten when they have a sufficiency of alkalies, for by their aid they form carbonate of lime, phosphate of lime, silicate of potash, &c., and make their stalks and leaves so hard and strong as to be almost impenetrable to the attacks of many insects that infest them. And their juices are so insipid that they are not so well realised by such insects.

Yours, &c.,

CHEMICO.

Wilkesbarre, Pa., October 4th, 1845.

[*Farmer's Cabinet.*]

CAUSE OF, AND REMEDY FOR THE POTATO ROT.

We have thought proper to copy from the London Gardener's Chronicle, of Sept. 13th, 1845, the report of the examination of Professor Charles Morren, of Brussels, into the cause and remedy for that dreadful scourge, the potato rot. We have done this because the high estimation in which his talents are held in Europe, as a vegetable physiologist, places him among the first authorities on the subject; and because a gentleman of his scientific character and attainments, would be very cautious in sending forth to the world any opinion at all on such an important subject, that had not been examined with the most scrupulous care, and with the light afforded by the improved state of science; and lastly, because the cause assigned, and remedies prescribed by Prof. Morren, very nearly

indeed coincide with those suggested by our esteemed scientific friend, J. E. Teschemacher, Esq., which were first published in the *N. E. Farmer*. This gentleman has informed us that his experiments and observations were given much more in detail, in a paper transmitted to the New York State Agricultural Society, which he hoped would in some manner have been brought to the public notice. But this the Society saw fit not to do.

Should the remedy these two gentlemen have suggested, prove successful, it will be a signal instance of the inestimable value of science to agriculture, and an earnest of numerous advantages yet to be derived from the same source.

With regard to the disease itself: the other causes assigned for it—as wetness, dryness, or heat of the season, degeneration of seed, method of planting, exhaustion of vigor by over-ripening, applying manure in the hill, insects, atmospheric influence, or an epidemic, (which latter terms are so indefinite as to mean anything or nothing,)—differ so infinitely in different accounts given of them, the effect of each in one location being often diametrically at variance with that in another, that it is utterly impossible to disentangle their perplexities, or to arrive at any distinct idea on which to found rational applications for cure. We trust, therefore, that next year, the remedies proposed by these gentlemen will be fully and fairly tried; should they fail, we shall only be replunged into our former sea of uncertainty. In the meantime, we recommend that all who take up their potatoes, should strew on them powdered quick-lime, or wash them in a solution of salt and water, (sulphate of copper, named below, is too poisonous,) for it appears to us, if the disease be the fungus, and this is destructible by these remedies, that the application must be beneficial in every case where the disease has not penetrated the skin of the potato, and that it will prevent the disease infecting those it has not yet attacked. The success of this trial with the present crop, will, we think, give us some ground to judge of the value of these remedies.—*Editor of the N. E. Far.*

[EXTRACT]

“I learn, by letters from several foreign friends, that the disease which now affects the potato crops in the Channel Islands, and in several parts of England, is universal in Belgium, and almost all through France; and as Professor Morren, of the University of Liege, has described the malady, and the remedy to be immediately applied, I have seized the first moment of leisure to translate part of a letter which he has inserted in the *Independance* of Brussels, for the benefit of those whom it may concern.

“The real cause of the disease is a *mildew fungus*, which scientific men class under the head *Botrytis*; but which farmers will easily distinguish, and will name a spot, scorch, or burn. Some will attribute it to humidity; others to dry winds, to insects, &c. Never-

theless, it is of consequence to know the real cause of this phenomena, for the knowledge of it puts the farmers on the road to diminish or destroy, if it is possible, the evil.

"The Professor has, for several days, followed the progress of the disease in several potato fields, and has come to the following results: The malady decidedly commences by the upper part of the leaves; in several instances he has seen the flowers and the seed-vessels first attacked. A part of the green tissue loses its color and becomes yellow; the spots soon after become grey, and it is always on the under part of the leaf, or on the seed-vessels, that, the next day or two days after the leaf has turned yellow, that you perceive the formation of a *white down*. The microscope shows that this down is formed by a fungus, which fructifies between the numerous hairs garnishing the under parts of the potato-leaf. This fungus is extremely thin; but it fructifies immensely, and reproduces itself by millions. The Professor, after having given a minute detail of the size, &c., of this fungus, concludes this part of his letter by saying: 'Farmers will tell me that this is a very small body to cause such immense ravages; but I will answer that the itch is not a malady less to be feared, because the *acaracus* which causes it, is a microscopic object. It is after the leaves have turned yellow, and the botrytis has made its appearance, that the stem is affected. Here and there the epidermis turns brown and black, and when you follow, with the use of the microscope, the infection, you soon perceive that it is by the skin that the stem is attacked. The morbid agent carries its action from the skin to the epidermis, and though you do not perceive fungus on this last part, it is not the less struck with death. For those who have a few notions of vegetable physiology, these effects are explained. The sap modified in living juice, in vegetable blood, forms itself in the leaf, and descends through the skin in the stem and the roots. There the sap being sickly, deadly, carries the poison from the leaf into the stem, and kills it. The fact is, that as soon as the black spots are seen on the stem, the leaves dry and die, and struck with death by a poisonous mushroom, they fall unfortunately to deposit in the ground the germs of the poison. The infection soon descends into the potato, and if the malady follows its natural course, it is soon affected with the gangrene; it turns brown or yellow, sometimes grey and dark, is soon spoiled, and the smell is so disagreeable, that the animals refuse to eat them.

"The disease being now known, the attention of agriculturists ought to be turned to diminish as much as possible the evil; because it is well known that all diseases which affect the corn crops, &c., once introduced into the country, remain and propagate more and more. This year the epidemic seems to be universal; the germ is everywhere; and if a remedy is not immediately applied, the crops will be affected next year, and then it will become more difficult to extirpate the evil.

"1. When the potato-haulm is infected with the disease, mow it down, and immediately burn it. 2. Act in the same way in potato-

fields that seem to have escaped the infection; for though they may appear so to the eye, yet they may not have escaped the disease. 3. The potatoes diseased ought also to be burned. 4. The seed for next year ought to be steeped with lime, sulphate of copper, or common salt, diluted in water, in order to kill the fungus, if any, on the potato. 5. The potato fields of next year, ought to be as far off as possible from those of this year. 6. A mixture of lime, common salt, and sulphate of copper, should be strewn on the potato fields infected—this mixture having the power of destroying the poison left in the ground by the infected plants.”

RICHARD GIFFARD.

St. Peter's, Jersey.

TO PREVENT SMUT IN WHEAT.

We have received, says the American Farmer, the annexed note from the Hon. Wm. Carmichael, whose authority with us is equal to that of any agriculturist of our State :

In the third volume of the Farmer's Register, page 743, there is an account of a series of experiments, made by M. M. de Bombasle, for preserving wheat from the smut, one of which he found entirely successful, and perhaps some benefit may be derived from an account of the advantage I have derived from its application.

Smut was brought on my farm by changing my seed wheat, and though it never extended so far as to produce very serious injury, I was very anxious to expel it; and, in the year 1843, I used the means in the article I have referred to, according to the manner therein directed. At the next harvest, I found the smut much diminished but some still remained. Last fall I used the same means, under a different application. I dissolved in a large tub eighteen pounds of glauber salts in twenty-two gallons of water. The wheat was thrown into it, well washed, and so much of the solution as was not taken up was drawn off for further application; the wheat was then put into a bed of quick lime (slaked immediately before being used) on my barn floor, well stirred so as to produce adhesion to each grain, and then spread to dry.

I have lately finished threshing. I have examined the wheat, and have not detected a smut ball. This is also the experience of my overseer, and my most observant laborers.

I do not know that the germinating power would be injured if it remained unsown for many days under the lime, but to avoid the hazard, I have not permitted the wheat thus prepared to remain more than three days unsown.

My neighbor, Mr. Wm. De Coursey, to whom I communicated the experiments of Mr. Bombasle, made one with common salt, by which the smut was much diminished, but some still remained. My experiments with glauber salts has resulted in entire success.

COST OF SHEEP KEEPING IN ILLINOIS.

BY A. CHURCHILL.

Messrs. Editors:—J. S. Skinner requests some of your correspondents to show, "by figures, at how low a price for wool sheep-growing may be followed as a livelihood." It will be a hard task for any one person to answer the question for the whole State, or even for one county, as the facilities for keeping sheep vary with every individual who keeps them; and without collecting an amount of sheep and feed statistics, at present entirely beyond the reach of any one man, a correct answer cannot be given. But I will attempt to give him the result of my estimate where the summer range on native feed is extensive, and where native hay can be cut in abundance.

I shall estimate for a flock of 1000, allowing a shepherd continually with them during the day, and folds for the night. Expense of shepherd, including board, - - - - - \$200

Two hundred tons of hay, cut and stacked - - - - - 200

Interest on fixtures and incidentals, - - - - - 100

\$500

Thus it seems that according to my estimate, fifty cents per head would be the least at which they could be kept. The shepherd could not be dispensed with during summer, unless the wolves were destroyed and the pasture fenced and well set with English grass.

There is one flock of 1000, wintering in Du Page county, the cost of which will be about seventy cents per head. The flock arrived late, and the feed must be purchased a little here and a little there, which adds at least fifty per cent. to the cost of wintering.

Wool should not be less than twenty cents per pound to enable the wool grower to make a "livelihood" of it in northern Illinois.

To Mr. Crocker's queries I would say that after ten years' experience in northern Illinois, I have found that sheep live well on grass or on what they find on the prairies in the fall, even till snow comes, *provided ALWAYS, that they are not confined to the same piece of ground.* Give them a new range every day, or give them English "grass or roots or both combined."

Prairie may be well set with grass by sowing the seed in the spring, and pasturing close afterwards. It is better to harrow on sowing the seed. Or sow on wet ground, mow in June, and pasture close through the remainder of the season; mow the next year in June, and pasture as before. The third mowing will be principally English grass, especially if timothy and red top are sowed in equal quantities. Or you may, if the season is wet, burn a piece of prairie on which a good coat of old grass remains in June. Sow on plenty of seed, harrow well with a sharp harrow, feed close

through the summer, and the next season the tame grass will be found very well set. If the weeds and wild grass are likely to overrun it, mow it in June, and your stock will keep the wild stuff down and allow the tame grass to get a good hold. If for pasture, blue-grass should be mixed with other seed.

If I had a large flock of sheep and my range was limited, I should in June break a piece of prairie proportioned to my flock. The last of July I would sow turnips and grass seed on the sod, harrow with a light sharp harrow, feed off the turnips in the fall, and expect a good crop of hay the next year. And so I would proceed until I had sufficient land stocked with tame grass.

Avon, Kane Co., 1845.

[*Prairie Farmer.*]

COWS.

Although we have been favored with the luxuries emanating from the cow ever since the flood, we are still very ignorant of her value, and of the proper mode of managing her in sickness and in health. We were taught to believe that it was unnecessary, indeed *improper* in all cases, to milk a cow before she had her first calf; and if I am not mistaken this belief prevails universally at the present day.

Our attention was recently called to a favorite Durham heifer, whose udder was considerably inflamed and distended, nearly three months before her time of calving, and gradually increased for two months, until the size was so enormous and the inflammation so great, that we were apprehensive matter would form in the udder. To prevent this, we ordered her udder to be well bathed, morning, noon and night, with water as warm as it could be applied without scalding. By this mode of treatment, the udder was relaxed, but gradually increased in size, until we were satisfied that she could not be relieved until she was milked. The first effort brought off several pints of thick serous, or watery matter; the second day the discharge was a mixture of water and milk, and on the third day we had the pleasure of measuring seventeen pints of milk, and from this time forward until she calved—which was about one month from the first time of milking—she yielded from 16 to 18 quarts of fine rich milk every day. The calf found the udder in fine condition for sucking, the teats all soft, and the milk flowed upon the slightest compression of his lips. In this way we preserved the udder of one of the finest cows we ever milked; and we feel very confident that if we had left nature to herself, the udder would have been spoiled.

J. SHELBY.

[*Tenn. Agricult.*]

Death from Guano dust.—The London Medical Times describes the case of a farmer, who died after a few days of extreme suffering, from hemorrhage, vomiting, &c., occasioned by his accidentally getting a small quantity of guano dust into his throat.

PROPORTION OF BUTTER IN MILK.

Every farmer's wife knows that there is a vast difference in the milk of cows, in regard to the quantity of butter which they will afford. We once owned a cow which gave a great flow of milk, but from which very little butter could be obtained.

Boussingault, in his "Rural Economy," relates the following experiment:

From 100 lbs. of milk, he obtained

Cream	-	-	-	-	-	-	-	-	15 60
White curd cheese,	-	-	-	-	-	-	-	-	8.93
Whey,	-	-	-	-	-	-	-	-	75.47

100.00

The 15 pounds and 60 hundredths of cream yielded by churning—

Butter,	-	-	-	3.33	-	-	-	-	or 21.2 per cent.
Buttermilk,	-	-	-	12.27	-	-	-	-	

The reckoning with reference to 100 lbs. of milk, consequently stands thus:

Cheese,	-	-	-	-	-	-	-	-	8.93
Butter,	-	-	-	-	-	-	-	-	3.33
Buttermilk,	-	-	-	-	-	-	-	-	12.27
Whey,	-	-	-	-	-	-	-	-	75.47

100.00

He goes on to state that, taking the whole of the milk obtained, and treated at different seasons of the year, he finds that 36,000 lbs. of milk yielded 1080 lbs. of fresh butter, which is at the rate of 3 per cent.

[*Genesee Farmer.*]

TRANSPLANTING.

The season is now at hand for transplanting. Let it be remembered that the fall—we mean early in the fall, as soon as the leaf begins to color and drop, is the best season of the year for transplanting all hardy trees, shrubs and plants. All forest deciduous trees intended for shade and ornament around dwellings and along streets, avenues and pleasure grounds, should be removed at this season, as well as all hardy fruit trees, such as apples, pears, plums and cherries. The rather more tender fruits, such as peaches, apricots, nectarines, and all tender and half-tender shrubs, roses, &c., are transplanted in spring with greater safety; though even these may be removed with safety, if done early and planted on a dry soil and protected by throwing a quantity of litter or rough stable manure around each. But whether transplanting be performed now or next spring, let it be done *well*. Dig large holes for the roots, prune off carefully all bruised or broken parts, set the tree in the place prepared for it,

and see that the roots are all in their natural position—not curled or bent up; then fill in good rich mellow earth among the roots; not the earth dug from the bottom of the hole, but earth prepared for the purpose. Use a pail of water to wash the earth in among the fibres. For small trees this is unnecessary. When the earth is all filled in, press it down with the foot. Guard against deep planting. A tree should not be planted more than an inch or so deeper than it stood before, to allow for the earth settling. [*Genesee Farmer.*]

NEGLECTED GARDENS.

The fall is the season to renovate and improve neglected gardens. All superannuated unhealthy trees, currant and gooseberry bushes, old worn out raspberry and strawberry plantations, should be dug up and cast away. The ground should be thoroughly manured and spaded, or trenched to the depth of eighteen inches at least.

When spring comes, the ground thus worked will be in readiness for planting. If postponed till spring, most likely, other labors will take precedence and it will be postponed. Garden walks should be laid out and improved, as it can be done much easier now than in spring, and at a much less cost. [*Ibid.*]

PRESERVING DAHLIA ROOTS.

Many people complain that they cannot succeed in preserving Dahlia roots through the winter. Nothing is easier. A Dahlia root is as easily saved as a potato. Let them be taken up on a fine dry day after the tops have been killed by frost, and exposed to the air and sun till quite dry—all the earth should be shook from around them—when perfectly dry they can be put away on a shelf in the cellar or in a box of dry sand. They should be examined during winter, and if any show signs of decay, the part should be cut off and the root dried. In putting them away, the name and color of each, if known, should be written on a wooden label, and this hung on the root with wire. It is satisfactory and convenient to know the name and color in planting, and besides, these systematic habits should be cultivated by all who aim at having neat gardens. [*Ibid.*]

TO MAKE SOAP WITHOUT BOILING.

Take one gallon of lye, strong enough to bear up an egg, to every pound of grease. Put the lye into your barrel, and strain the grease hot through a sieve or cullender. Stir this three or four times a day, or until it thickens. By this process you have soap, clean and with much less trouble than in the old way. [*Amer. Agricult.*]

DISSOLUTION.

The undersigned have sold out their entire interest in the "Bommer Manure method" to Mr. George Bommer, of N. Y; in consequence of which the partnership heretofore existing between us, was dissolved on the 6th ultimo by mutual consent.

Our agents are requested to make up their accounts to the 6th of November, and forward them to Tho. M. Abbett, Baltimore, who is solely authorised to settle.

For any transactions after that date they will account to Mr. Bommer.

TH. M. ABBETT,
CHARLES BAER,
JOHN GOULIART.

Baltimore, Dec. 14, 1844.

N.B.—Charles Baer is the General Agent for Mr. Bommer in Georgia, and John Goliart his General Agent for the State of Maryland.

BOMMER'S MANURE METHOD.

We have the satisfaction to announce to the Planters, Farmers and Gardeners of the vicinity of Charleston, that the Books with the Patent right, which Mr. Baer has caused to be sent on to the subscriber for disposal, have been received from Baltimore, and may be had of him on the terms before specified. Those who have bespoke them, will do well to call and obtain copies early. He also has received a report made to the Legislature of Maryland in favor of the method, which is daily gaining the public confidence whenever it is known. In the mean time we refer our readers to the last December and March Nos. of the Southern Agriculturist for some information on the subject.

A. E. MILLER,
No. 4, Broad-street.



PLOUGHS, &c.

The subscriber has constantly on hand, Ploughs of every description, embracing nearly all the patterns of Freeborn, Mayhu Davis, and those from the celebrated manufactory of Ruggles, Nourse and Mason. His prices range from \$3 to \$10, according to the size and quality. Where many are taken and paid for at the time, a deduction will be made on the usual prices. Also Cultivators Corn and Cob Crushers at reduced prices; Mott's Agricultural Furnaces, and every implement required for the field or garden.

J. D. LEGARE,
No. 81 East-Bay.

RUFFIN'S CALCAREOUS MANURES \$1.

ELEMENTS OF AGRICULTURAL CHEMISTRY,

In a course of Lectures for the Board of Agriculture, delivered between 1802 and 1812. By Sir H. Davy.

WESTOVER MANUSCRIPTS,

Containing the history of the Dividing Line between Virginia and North-Carolina. By Wm. Bird of Westover.

THE BANK REFORMER. By Edmund Ruffin.

THEORY AND PRACTICE OF DRAINING AND EMBANKING. By John Johnston, Esq.

For sale at

A. E. MILLER'S, No 4 Broad-st.

TO OUR READERS.

Agreeably to a resolution of the South-Carolina Agricultural Society, we have inserted in our Number of this month, a very valuable communication *on the effect of drought upon rice lands*, by DR. J. LAWRENCE SMITH, read before that Society on the 21st of October. We call the attention of our Rice Planters to its consideration, as they are particularly interested in the importance of the facts it discloses.

We continue the "*Meteorological Considerations*" from Boussingault's Rural Economy, which will be found highly interesting to those fond of scientific information.

The Proceedings of the State Agricultural Society, we copied as soon as they reached us from the Columbia South-Carolinian, and although published in other papers will not lose their value, especially the *Report on the scheme of reducing the quantity of cotton grown*, by W. B. SEABROOK and J. BELTON O'NEALL.

We also copy a full account of the *failure to cultivate American cotton in India*, by the British Government, as highly important to our Southern and South-Western States.

The letter of Dr. Joseph Johnson of our City to Mr. F. Markoe, Corresponding Secretary of the National Institute, at Washington, *describing the Silk Plant*, will also be found interesting, and tends to develop the resources with which our country abounds for the convenience of man.

The other articles must speak for themselves.

TO OUR DISTANT AND NON-PAYING SUBSCRIBERS.

Persons at a distance indebted for the *Southern Agriculturist*, will please forward their money by mail, in the best bills they can obtain.

We hope that this notice will not be in vain—and that those persons who visit Charleston from the country will not *forget to call and pay their bills*. In the close of the Work with Mr. Legare in 1841, it was our misfortune to lose many subscribers, and also a large amount of subscription money due by adhering to a rule to strike off all who were indebted for three years, and we should not like to *inflict on our pockets* such another loss; but we must have funds to carry on the work or stop it—to the shame of our patrons. Not a dollar received the past month.

MILLER'S *Planters and Merchants' Almanac* **For 1846,**

Is published and ready for sale on the usual terms \$6 per groce. Orders from the country, enclosing the cash, promptly attended to by

A. E. MILLER.